

PRELIMINARY AMENDMENT
Divisional of Appln. No. 09/322,978

A2
Positive photoresist compositions comprising an alkali-soluble resin and a quinonediazide ester have been satisfactorily applied in practice for the production of semiconductor devices and liquid-crystal display devices, since they have excellent definition, sensitivity and etching resistance.

Replace the paragraph bridging pages 8-9 with the following paragraph:

A3
FIG. 1 illustrates a developing process and locations for the evaluation of sensitivity on resist patterns in the examples of the invention;

IN THE CLAIMS:

Please cancel claim 5 without prejudice or disclaimer.

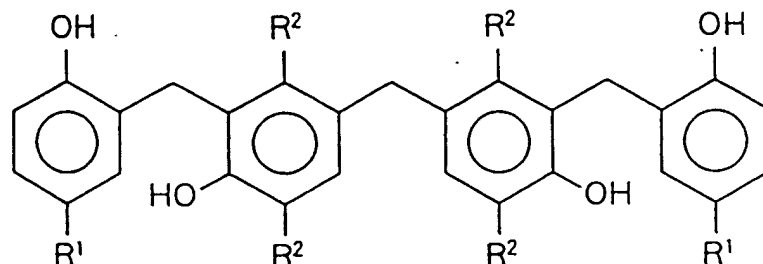
Please enter the following amended claims:

Please add the following new claims:

A4
7 (new). A positive photoresist composition comprising

(A) an alkali soluble resin,

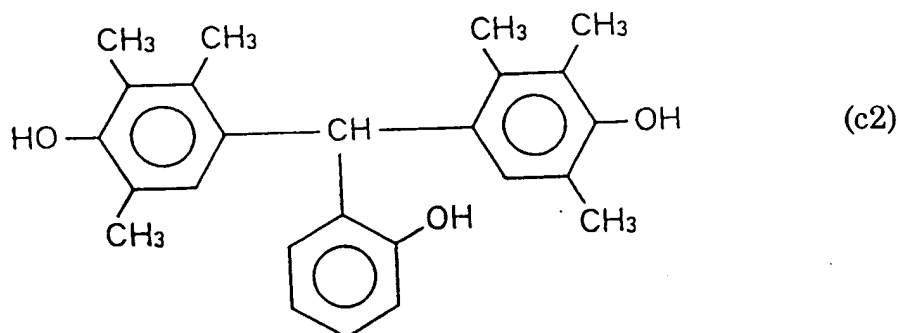
(B) a photosensitizer containing a quinonediazide ester of a compound of the following formula (I):



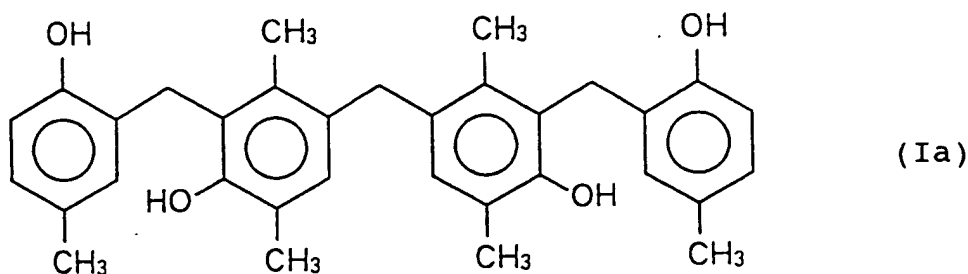
PRELIMINARY AMENDMENT
Divisional of Appln. No. 09/322,978

wherein each of R¹ and R² is independently a methyl group or an ethyl group, and

(C) at least one compound of phenol group-containing compounds having structural formula (C2) and having an elution time in the range from 6 to 30 minutes in high performance liquid chromatography, said high performance liquid chromatography being conducted under the following conditions: eluent: a mixed solvent of water:tetrahydrofuran:methanol = 40:24:36 (by weight); column: 4.6 mm (diameter) x 150 mm (length) containing 5 μ m silica gel as a filler (carbon content being about 15%); column temperature: 45.0°C; and supply rate of eluent: 0.700 ml/min

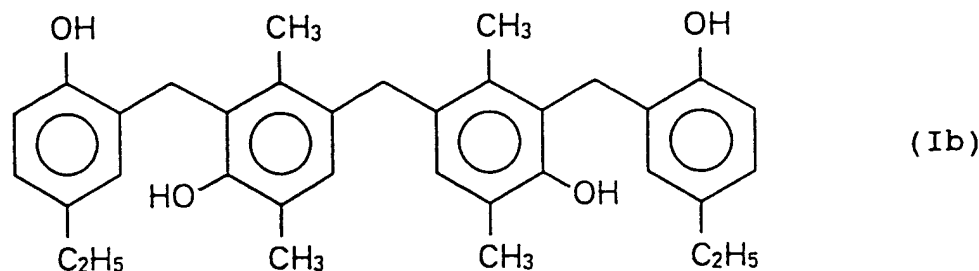


8 (new). The composition according to claim 7, wherein said compound represented by the formula (I) is a compound of the following formula (Ia):



PRELIMINARY AMENDMENT
Divisional of Appln. No. 09/322,978

9 (new). The composition according to claim 7, wherein said compound represented by the formula (I) is a compound of the following formula (Ib):



10 (new). The composition according to claim 7, wherein the content of Ingredient (C) ranges from 5% to 50% by weight relative to Ingredient (A).

11 (new). A process for forming a resist pattern comprising the steps of:

(1) coating the positive photoresist composition of claim 7 onto a substrate having a diameter ranging from 8 to 12 inches, and drying the coated substrate to form a resist film,

(2) subjecting said resist film to selective exposure through a mask,

(3) heating said resist film, and

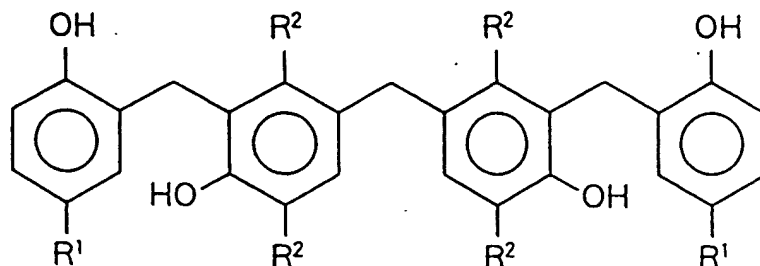
(4) removing the resist film at exposed positions by an aqueous alkali solution.

12 (new). A positive photoresist composition comprising

(A) an alkali soluble resin,

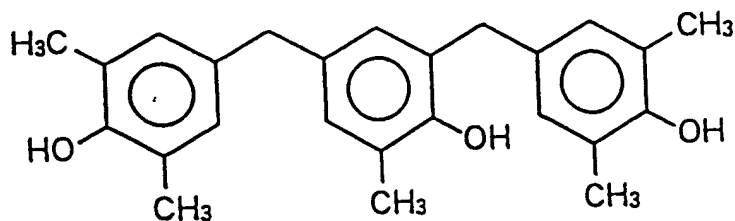
PRELIMINARY AMENDMENT
Divisional of Appln. No. 09/322,978

(B) a photosensitizer containing a quinonediazide ester of a compound of the following formula (I):



wherein each of R^1 and R^2 is independently a methyl group or an ethyl group, and

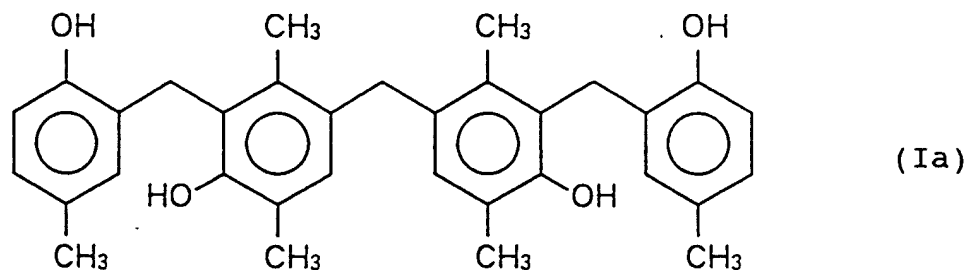
(C) at least one compound of phenol group-containing compounds having structure formula (C3) and having an elution time in the range from 6 to 30 minutes in high performance liquid chromatography, said high performance liquid chromatography being conducted under the following conditions:
eluent: a mixed solvent of water:tetrahydrofuran:methanol = 40:24:36 (by weight);
column: 4.6 mm (diameter) x 150 mm (length) containing 5 μ m silica gel as a filler (carbon content being about 15%); column temperature: 45.0°C; and supply rate of eluent: 0.700 ml/min



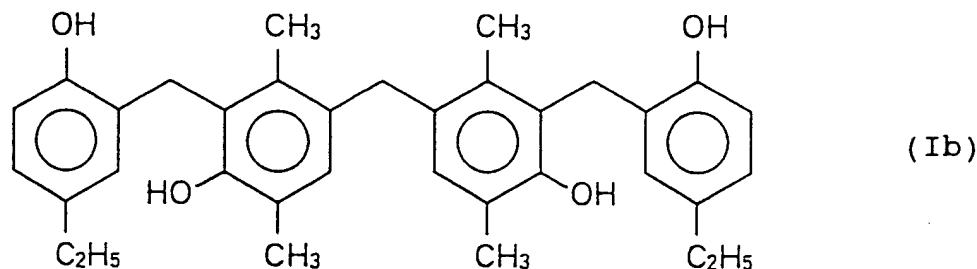
(c3)

PRELIMINARY AMENDMENT
Divisional of Appln. No. 09/322,978

13 (new). The composition according to claim 12, wherein said compound represented by the formula (I) is a compound of the following formula (Ia):



14 (new). The composition according to claim 12, wherein said compound represented by the formula (I) is a compound of the following formula (Ib):



15 (new). The composition according to claim 12, wherein the content of Ingredient (C) ranges from 5% to 50% by weight relative to Ingredient (A).

16 (new). A process for forming a resist pattern comprising the steps of:

(1) coating the positive photoresist composition of claim 12 onto a substrate having a diameter ranging from 8 to 12 inches, and drying the coated substrate to form a resist film,

(2) subjecting said resist film to selective exposure through a mask,

PRELIMINARY AMENDMENT
Divisional of Appln. No. 09/322,978

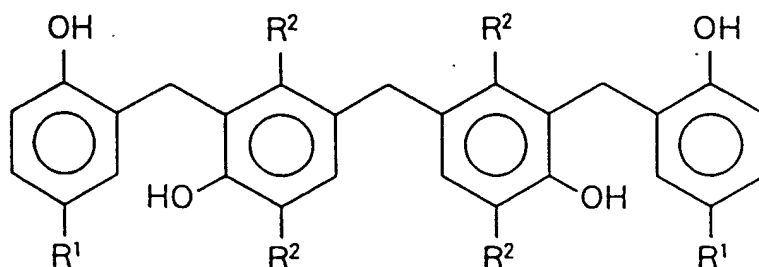
(3) heating said resist film, and

(4) removing the resist film at exposed positions by an aqueous alkali solution.

17 (new). A positive photoresist composition comprising

(A) an alkali soluble resin,

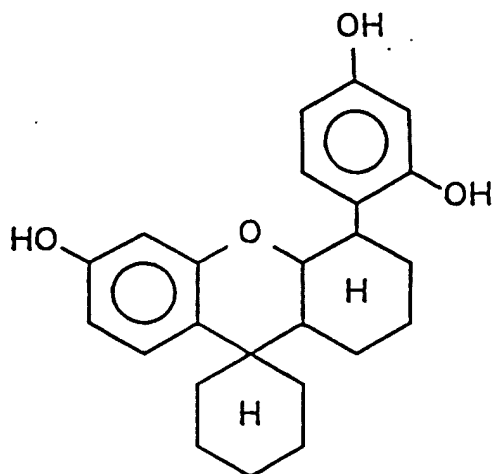
(B) a photosensitizer containing quinonediazide ester of a compound of the following formula (I):



wherein each of R¹ and R² is independently a methyl group or an ethyl group, and

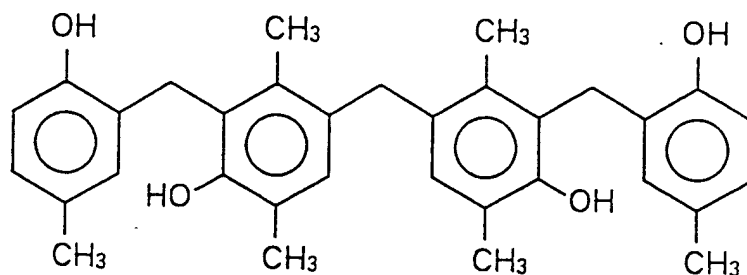
(C) at least one compound of phenol group-containing compounds having structural formula (C4) and having an elution time in the range from 6 to 30 minutes in high performance liquid chromatography, said high performance liquid chromatography being conducted under the following conditions: eluent: a mixed solvent of water:tetrahydrofuran:methanol = 40:24:36 (by weight); column: 4.6 mm (diameter) x 150 mm (length) containing 5 μ m silica gel as a filler (carbon content being about 15%); column temperature: 45.0°C; and supply rate of eluent: 0.700 ml/min.

PRELIMINARY AMENDMENT
Divisional of Appln. No. 09/322,978



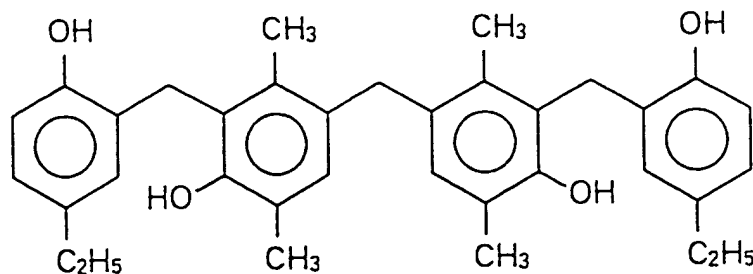
(c4)

18 (new). The composition according to claim 17, wherein said compound represented by the formula (I) is a compound of the following formula (Ia):



(Ia)

19 (new). The composition according to claim 17, wherein said compound represented by the formula (I) is a compound of the following formula (Ib):



(Ib)

PRELIMINARY AMENDMENT
Divisional of Appln. No. 09/322,978

20
21 (new). A process for forming a resist pattern comprising the steps of:

(1) coating the positive photoresist composition of claim 17 onto a substrate having a diameter ranging from 8 to 12 inches, and drying the coated substrate to form a resist film,

(2) subjecting said resist film to selective exposure through a mask,

(3) heating said resist film, and

(4) removing the resist film at exposed positions by an aqueous alkali solution.

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